

HIGH TEMPERATURE JOINTS FOR DISSIMILAR MATERIALS

ABSTRACT

5 Composite joints for gas-tight members that exhibit
different coefficients of thermal expansion are disclosed. Broadly,
apparatus of the invention provides composite joints which
include a girdle of a resilient material disposed between mating
surfaces of a high strength metallic member and a nonmetallic
10 member in an arrangement wherein a difference in fluid
pressures across the joint provides compressive force upon the
girdle through tapered mating surfaces thereby improving
resistance to fluid leakage. Composite joints of the invention are
particularly useful for joining a high strength weldable metallic
15 conduit and a gas-tight ceramic member having a tubular
structure, closed at one end, with a tapered mating surface at a
distal end thereof contiguous with a portion of the girdle.

Processes beneficially using joints in accordance with the
invention include converting methane gas into value-added-
20 products, for example, production of synthesis gas comprising
carbon monoxide and molecular hydrogen. Advantageously, the
synthesis gas is free of deleterious and/or inert gaseous diluents
such as nitrogen.

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